

3/pds

JC20 Rec'd PCT/PTO 29 JUN 2005

A LOADER FOR AGRICULTURAL TRACTORS

The present invention relates to a loader for agricultural tractors.

5 One problem experienced on smaller farms resides in the need of a so-called front loader, i.e. a tractor-like vehicle that includes two externally mounted hydraulically manoeuvrable lifting arms for supporting a bucket or lifting forks or some other implement or appliance at their free ends.

10 The problem arises because the purchasing cost of such front loaders is too high in relation to the use of the vehicle, meaning that small farms are often forced to manage without the use of a front loader.

Agricultural tractors do not come equipped with externally mounted lifting arms and it is  
15 expensive to modify such a tractor by fitting it with such arms.

This problem is solved by the present invention, which provides a solution which enables a conventional tractor to be readily and cheaply fitted with a working implement or appliance so that the tractor can fulfil the function of a front loader.

20

The present invention thus relates to a loader for agricultural tractors equipped with standard hydraulically manoeuvrable, parallel lifting arms which are pivotally mounted in the rear part of the tractor and include a centre attachment in the tractor between the lifting arms, wherein the loader is characterised in that it includes two parallel arms which are  
25 intended to be attached in respective lifting arms such as to extend rearwardly generally in the longitudinal direction of said lifting arms; in that a centre rod that can be extended hydraulically during operation extends outwardly from said centre attachment parallel with the lifting arms; and in that respective arms and the outer end of the centre rod are intended for connection to a working implement or appliance.

30

The invention will now be described in more detail partially with reference to an exemplifying embodiment thereof illustrated in the accompanying drawings, in which

Figure 1 is a view of a tractor seen obliquely from the rear and including features according to the present invention;

Figure 2 is a perspective view of an inventive arrangement;

5      Figures 3 and 4 are respective views of the Figure 2 arrangement in different positions;

Figure 5 illustrates different lifting heights; and

Figure 6 illustrates different attachment points.

Both small and larger conventional tractors are equipped with standardised hydraulically manoeuvrable and parallel lifting arms attached to the rear part of the tractor. The arms are  
10      intended to support different working implements, such as ploughs, harrows, etc., and are able to raise and lower the same as required.

The invention relates to a loader for tractors equipped with such standardised hydraulically manoeuvrable parallel lifting arms 1, 2 pivotally attached in the rear part of the tractor and  
15      provided with a centre attachment 3 in the tractor 4 between said lifting arms 1, 2.

As will be apparent from Fig. 3, the inventive loader includes two parallel arms 5, 6 which are intended to be fastened in respective lifting arms 1, 2 so as to extend rearwardly out  
20      from the tractor generally in the longitudinal direction of the of the lifting arms 1, 2.

A centre rod 7 which can be extended hydraulically during operation extends outwards from the centre attachment 3 parallel with the lifting arms 1, 2 and with the arms 5, 6.

25      Respective arms 5, 6 and the outer end of the centre rod 7 are intended for connection to a working implement.

According to one preferred embodiment, respective arms 5, 6 and the outer end 8, 9, 10 of the centre rod 7 are intended for connection to an attachment 11 to which a working  
30      implement 12 shall be attached. The ends 8, 9, 10 are pivotally attached in the attachment whereas the implement is fixedly connected thereto.

Alternatively, respective arms 5, 6 and the outer end 8, 9; 10 of the centre rod 7 can be adapted for direct connection to a working implement.

The loader is made of a suitable steel material.

Although the working implement 12 is shown in the drawings in the form of a bucket or scoop, it will be understood that it may consist of any implement or appliance whatsoever, such as lifting forks, a lifting bar or rod for lifting cement pipes, a platform or snow plough. The present invention is therefore not restricted to any given form of implement. Neither is the invention restricted to any particular attachment design, since the person skilled in the art will be able to adapt the attachment means to the implement concerned.

The arms 5, 6 and the implement 12 are lifted in response to lifting of the lifting arms 1, 2. The implement can be tilted, i.e. swung about a horizontal axis, by changing the length of the centre rod.

The swing range of the standardised lifting arms is such that the arms will not define a sufficiently small angle with the vertical plane when raised to a maximum; see Fig. 5 which shows the lifting arm when swung up to its end position.

The arms 5, 6 are therefore bent upwards in a region 13, 14 outwardly of and close to the free ends 15, 16 of the lifting arms 1, 2. This achieves a high implement lifting height while allowing the implement to be lowered down onto the ground.

Figure 5 illustrates swinging of the loader in a vertical plane. In this case, the arms 5, 6 are designed for a lifting height of roughly 2.5 metres, which is sufficient for the majority of tasks on a typical farm. The lifting height can be increased by making the arms 5, 6 longer. However, longer arms will reduce the maximum load bearing capacity.

According to one preferred embodiment, the bending angle of the arms 5, 6 is adjustable, therewith enabling the maximum lifting height of the arms to be varied. In one simple embodiment, respective arms 5, 6 are divided and hinged about a joint 27, said arm parts being provided with holes 28 – 30, as shown in Fig. 5, for co-action with a pin (not shown) so as to hold the arms at the chosen bending angle.

According to one preferred embodiment there is provided at the outer end 8, 9 of respective arms a joint that functions to pivotally support an implement attachment means

or an implement. A joint for pivotal connection to an implement 12 is provided at the free end 10 of the centre rod 7.

5 In a preferred embodiment the centre rod 7 includes along its length an hydraulic piston-cylinder device which is used to change the length of the centre rod, said device being driven by the tractor's hydraulic system.

10 Preferably, the free end 10 of the centre rod 7 will include a number of attachment points 18 – 20 for co-action with the attachment (11) or an implement (12) at mutually different distances from the opposite end 21 of said rod. The attachment 11 may also be provided with different attachment points 22, 23, for attachment of the free end of the centre rod 7.

15 The centre attachment 3 is also preferably provided with a number attachment points 24 – 26 for co-action with the inner end of the centre rod 7.

The various attachment points 18 – 20, 22, 23, 24 - 26 enable the attachment means to be adapted to suit different implements according to their geometrical designs.

20 According to one highly preferred embodiment, respective arms 5, 6 are secured at their inner parts to the standard attachment means of respective lifting arms 1, 2 by means of cotter pins, split pins or the like 31. It is also preferred that respective arms 5, 6 project to some extent in beneath respective lifting arms 1, 2 and abut against the underside of said lifting arms, as shown in Fig. 3. This means that said pins 31 of this embodiment are the sole means required to effect attachment of the arms to the lifting arms, therewith enabling  
25 the inventive loader to be secured in a very simple manner.

It will be obvious that the present invention provides an easy and inexpensive solution to the problem mentioned in the introduction.

30 Although the invention has been described above with reference to a number of embodiments thereof, it will be obvious to the person skilled in the art that the structural design of the loader can be varied.

The invention shall not therefore be considered to be limited to the above described and illustrated embodiments, since modifications can be made within the scope of the following claims.